



North Dakota State Water Commission

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MEMORANDUM

TO: Dale Frink, State Engineer, NDSWC

FROM: Michael S. Noone, Planner III, NDSWC

SUBJECT: Minnesota Interbasin Transfers

DATE: September 29, 2003

Interbasin transfer of water has been the topic of a great deal of debate, when discussing some of North Dakota's proposed water projects, such as the Devils Lake outlets, the Northwest Area Water Supply Project, and the Red River Valley Water Supply Project.

There are two issues that are frequently raised by those concerned about North Dakota's water transfer projects. The first issue is the quantity of water that will be discharged from one basin to another. The second issue is the degree of treatment that the diverted water will be subjected to, in order to minimize the risks of biota transfer.

In the interest of putting this matter into perspective, information was gathered on known interbasin transfers in Minnesota. For the purposes of this document, an interbasin transfer is defined as the transfer of water from one hydrologically distinct basin to another. That may refer to removing water from a closed-basin lake, or pumping water across a major drainage basin divide. A closed-basin lake is a waterbody that is hydrologically unconnected to other waterbodies, at least since European settlement.

Minnesota Closed-Basin Lakes With Pumped Outlets

Information on closed-basin lakes with known outlets was compiled with the assistance, and using the resources of various staff members of the Minnesota Department of Natural Resources (MNDNR) and two watershed district engineers, who are identified at the end of this document.

In the case of the outlets of Bailey, Charlotte, Holiday-Wing, Pulaski, and Sarah-Union lakes, the actual permits or project descriptions were provided by the relevant MNDNR official, or district engineer. Information on the remaining lake outlets was obtained through telephone conversations with the appropriate officials in the MNDNR or watershed district.

According to the MNDNR, there are currently 79 known closed-basin lakes in Minnesota with some form of an outlet. Nine of those outlets incorporate some sort of tiling to move water out of the lake; one outlet was pumped in the past, but no longer appears to be pumped; three outlets are siphoned; eleven outlets are pumped; five outlets incorporate culverts; four outlets incorporate a ditch; five outlets have a gated control; and one outlet is unauthorized. For the 38 remaining outlets, no additional information was provided, other than the fact that they exist.

Biota Transfer Controls

According to the permits, project descriptions, and conversations held with MNDNR hydrologists and district engineers, controls to prevent the transfer of biota are rare. Of the 12 outlets with maximum discharge information, only three of them had some form of biota transfer control, specifically a screen. One additional outlet had a screen, but it was included as a safety measure, not to prevent biota transfer. All of the Minnesota closed-basin lakes for which maximum discharge information was available, and that have some sort of biota transfer control in place, are in the Mississippi River basin. Of the five lake outlets in the Red River basin with maximum discharge information, none appear to have any form of biota transfer control in place.

Lake Discharge Information

The maximum discharge data is available for 12 outlets. Eleven of the outlets are pumped, and one outlet is a siphon. Please note that this is a minimum estimate for the total flow of water that can be diverted from closed-basin lakes in Minnesota. Due to the hydrological difficulties in estimating maximum discharge for culvert outlets or tiled outlets, no maximum discharge numbers are included for the remaining 65 lakes described in this document. Given these difficulties, the total maximum discharge for all closed-basin lakes in Minnesota with some form of an artificial outlet is undoubtedly higher than is presented here.

<u>Basin</u>	<u>Lake</u>	<u>County</u>	<u>Max Discharge</u>	<u>Biota Controls</u>
Mississippi	Crystal	Hennepin	3 cfs	Screen
Mississippi	Charlotte	Wright	4.5 cfs	Screen*
Mississippi	Cedar Island	Hennepin	5 cfs	None
Mississippi	Holiday-Wing	Hennepin	5.5 cfs	Screen**
Mississippi	South Turtle	Otter Tail	15 cfs	None
Mississippi	Pulaski	Wright	18 cfs	Screen***
Mississippi	Bailey	Washington	75 cfs****	None
Red	Turtle	Becker	10 cfs	None
Red	Long	Becker	10 cfs	None
Red	Sarah-Union	Polk	20 cfs	None
Red	Ida	Becker	25 cfs	None
Red	Big Cormorant	Becker	25 cfs	None
			<u>Total</u>	216 cfs

*Screened to prevent fish transfer.

**Intake pipe screened as a safety measure.

***Permit was granted with the addition of a 0.5mm screen, when lake was known to contain Eurasian water milfoil (*Myriophyllum spicatum*), and receiving waterbody did not. Screen was eventually removed after milfoil presence was detected in receiving waterbody.

****Bailey Lake is proposing increasing their maximum flow to 150 cfs.

Minnesota Interbasin Water Transfer Projects:

A 1988 report prepared cooperatively between the MNDNR and the United States Geological Survey, details several water projects in Minnesota that transfer water across major basin divides. It is unclear from this document whether any of these connections still exist, or if they have some form of biota transfer control in place.

<u>Source-Receiving Basin</u>	<u>Owner</u>	<u>County</u>	<u>Category</u>	<u>Flow</u>	<u>Biota Controls</u>
Mississippi-Red	New York Mills	Otter Tail	Sewer	0.03 cfs	?
Red-Mississippi	Donnelly	Stevens	Water Supply	0.015 cfs	?
Red-Mississippi	Arvin Menze	Otter Tail	Irrigation	0.046 cfs	?
Red-Mississippi	Henning	Otter Tail	Water Supply	0.03 cfs	?
Red-Mississippi	Henning	Otter Tail	Sewer	0.19 cfs	?
Red-Mississippi	New York Mills	Otter Tail	Water Supply	0.015 cfs	?
Red-Great Lakes	Virginia	St. Louis	Mine Dewatering	1.73 cfs	?
Red-Great Lakes	Virginia	St. Louis	Sewer	1.67 cfs	?
Missouri-Mississippi	Lincoln-Pipestone Cnty	Lincoln	Water Supply	0.11 cfs	?
Missouri-Mississippi	Lincoln-Pipestone Cnty	Lincoln	Water Supply	0.11 cfs	?
Missouri-Mississippi	Worthington	Nobles	Water Supply	0.17 cfs	?
<u>Total Flow (1988)</u>				4.12 cfs	

Conclusion

Many jurisdictions are involved in interbasin water transfer projects. Some of these projects have been in place for many years, while others were built as recently as the late 1990's. In terms of total known discharge, the State of Minnesota has the capability to move approximately 220 cfs of water across basin boundaries, and this is likely a conservative estimate. In terms of biota control, Minnesota is only known to currently have some form of prevention on three of its projects, which leaves the remaining 87 projects with no apparent controls.

The known and documented facts suggest that interbasin transfer of water is a broader issue than it first appears. North Dakota's proposed water projects are not the first of their kind, and have in fact been more thoroughly examined than similar projects in Minnesota or other neighboring states and provinces. Given what is occurring, not only in Minnesota, but also in states and provinces across North America, the question can be raised on whether North Dakota's proposed water projects truly represent a greater risk than those already in place.

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MN/322